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SAF-RC-032
100-F Remaining Sites Burial Grounds - Soil Full Protocol
FINAL VALIDATION PACKAGE

COMPLETE COPY OF VALIDATION PACKAGE TO:

Jeanette Duncan (2) H9-02 JE 07/05/06
INITIAL/DATE

COMMENTS:

SDG K0321 SAF-RC-032

Waste Site: 128-F-3

Date: 21 June 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-F Remaining Sites Burial Grounds – Soil Full Protocol - Waste Site 128-F-3
Subject: Volatile Organics - Data Package No. K0321-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0321 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Matrix	Validation	Method
J11VW0	4/11/06	Soil	C	VOAs by 8260B
J11VW0R	4/11/06	Soil	C	VOAs by 8260B*
J11VW1	4/11/06	Soil	C	VOAs by 8260B
J11VW1R	4/11/06	Soil	C	VOAs by 8260B*
J11VW2	4/11/06	Soil	C	VOAs by 8260B
J11VW3	4/11/06	Soil	C	VOAs by 8260B
J11VW4	4/11/06	Soil	C	VOAs by 8260B
J11VW4R	4/11/06	Soil	C	VOAs by 8260B*
J11VW5	4/11/06	Soil	C	VOAs by 8260B
J11VW5R	4/11/06	Soil	C	VOAs by 8260B*
J11VW6	4/11/06	Soil	C	VOAs by 8260B
J11VW6R	4/11/06	Soil	C	VOAs by 8260B*

*- Re-prepared and re-analyzed.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, February 2005). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

· Holding Times

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Samples must be analyzed within 14 days of the date of sample collection. If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were met.

· Method Blanks

Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the CRQL and is less than five times (or less than ten times for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected "U".

Due to method blank contamination, the methylene chloride results in all samples were qualified as undetected and flagged "U".

Due to method blank contamination, the chloroform results in all samples were qualified as undetected and flagged "U".

Due to method blank contamination, the acetone results in samples J11VW2 and J11VW5R were raised to the RQL, qualified as undetected and flagged "U".

Due to method blank contamination, all detected 4-methyl-2-pentanone, 2-hexone, chlorobenzene, styrene and xylene results were raised to the RQL, qualified as undetected and flagged "U".

All other method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries below control limits are qualified as estimates and flagged "UJ". Undetected sample results are not qualified if the spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

Due to the lack of a matrix spike/matrix spike duplicate analysis, all volatile organic results in samples J11VW5R and J11VW6R were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If two surrogates of the same class of compounds (base/neutral or acid) are out of control limits, all associated sample results greater than the contract required quantitation limit (CRQL) are qualified as estimates and flagged "J". Sample results less than the CRQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the CRQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

Due to surrogate recoveries outside QC limits, all detected volatile organic results in sample J11VW0R were qualified as estimates and flagged "J".

All other surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of +/-30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

Due to the lack of a matrix spike/matrix spike duplicate analysis, all volatile organic results in samples J11VW5R and J11VW6R were qualified as estimates and flagged "J".

All other precision results were acceptable.

Field Duplicate Samples

One set of field duplicates (J11VW0/J11VW1 and J11VW0R/J11VW1R) was submitted for analysis but both samples were re-prepared and re-analyzed and both sets were compared. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQL's) to ensure that laboratory detection levels meet the required criteria. Seventy-seven analytes exceeded the RQL. Under the WCH statement of work, no qualification is required. All other analytes met the RQL.

- **Completeness**

Data package No. K0321 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to method blank contamination, the methylene chloride results in all samples were qualified as undetected and flagged "U".
- Due to method blank contamination, the chloroform results in all samples were raised to the RQL, qualified as undetected and flagged "U".
- Due to method blank contamination, the acetone results in samples J11VW2 and J11VW5R were raised to the RQL, qualified as undetected and flagged "U".
- Due to method blank contamination, all detected 4-methyl-2-pentanone, 2-hexone, chlorobenzene, styrene and xylene results were raised to the RQL, qualified as undetected and flagged "U".
- Due to the lack of a matrix spike/matrix spike duplicate analysis, all volatile organic results in samples J11VW5R and J11VW6R were qualified as estimates and flagged "J".
- Due to the lack of a matrix spike/matrix spike duplicate analysis, all volatile organic results in samples J11VW5R and J11VW6R were qualified as estimates and flagged "J".
- Due to surrogate recoveries outside QC limits, all detected volatile organic results in samples J11VW0R were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

Seventy-seven exceeded the RQL. Under the WCH statement of work, no qualification is required.

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the WCH validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the same quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

VOLATILE ORGANIC DATA QUALIFICATION SUMMARY*

SDG: K0321	REVIEWER: [illegible]	Project: 1128-F-3	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Methylene chloride	U	All	Blank contamination
Chloroform	U at RQL	All	Blank contamination
Acetone	U at RQL	J11VW2, J11VW5R	Blank contamination
4-Methyl-2-pentanone 2-Hexone Chlorobenzene Styrene Xylene	U at RQL	All detects	Blank contamination
All	J	J11VW5R, J11VW6R	No MS/MSD
All detected results	J	J11VW0R	Surrogate recovery

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

VOLATILE ORGANIC ANALYSIS, SOIL MATRIX (UG/KG)

Project: WASHINGTON CLOSURE HANFORD																	
Laboratory: LLI																	
Case:	SDG: K0321																
Sample Number		J11VW0		J11VW0R		J11VW1		J11VW1R		J11VW2		J11VW3		J11VW4		J11VW4R	
Remarks				Reprep		Duplicate		Reprep								Reprep	
Sample Date		4/11/06		4/11/06		4/11/06		4/11/06		4/11/06		4/11/06		4/11/06		4/11/06	
Analysis Date		4/24/06		4/24/06		4/24/06		4/24/06		4/24/06		4/24/06		4/24/06		4/24/06	
VOA	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	11	U	11	U	11	U	11	U	11	U	10	U	11	U	11	U
Bromomethane	10	11	U	11	U	11	U	11	U	11	U	10	U	11	U	11	U
Vinyl Chloride	10	11	U	11	U	11	U	11	U	11	U	10	U	11	U	11	U
Chloroethane	10	11	U	11	U	11	U	11	U	11	U	10	U	11	U	11	U
Methylene Chloride	10	18	U	30	U	16	U	34	U	15	U	12	U	21	U	30	U
Acetone	10	11	U	11	U	11	U	11	U	10	U	10	U	11	U	11	U
Carbon Disulfide	10	6	U	6	U	6	U	6	U	6	U	5	U	6	U	6	U
1,1-Dichloroethene	10	6	U	6	U	6	U	6	U	6	U	5	U	6	U	6	U
1,1-Dichloroethane	10	6	U	6	U	6	U	6	U	6	U	5	U	6	U	6	U
1,2-Dichloroethene (total)	10	6	U	6	U	6	U	6	U	6	U	5	U	6	U	6	U
Chloroform	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
1,2-Dichloroethane	10	6	U	6	U	6	U	6	U	6	U	5	U	6	U	6	U
2-Butanone	10	11	U	11	U	11	U	11	U	11	U	10	U	11	U	11	U
1,1,1-Trichloroethane	10	6	U	6	U	6	U	6	U	6	U	5	U	6	U	6	U
Carbon Tetrachloride	10	6	U	6	U	6	U	6	U	6	U	5	U	6	U	6	U
Bromodichloromethane	10	6	U	6	U	6	U	6	U	6	U	5	U	6	U	6	U
1,2-Dichloropropane	10	6	U	6	U	6	U	6	U	6	U	5	U	6	U	6	U
cis-1,3-Dichloropropene	10	6	U	6	U	6	U	6	U	6	U	5	U	6	U	6	U
Trichloroethene	10	6	U	6	U	6	U	6	U	6	U	5	U	6	U	6	U
Dibromochloromethane	10	6	U	6	U	6	U	6	U	6	U	5	U	6	U	6	U
1,1,2-Trichloroethane	10	6	U	6	U	6	U	6	U	6	U	5	U	6	U	6	U
Benzene	10	6	U	6	U	6	U	6	U	6	U	5	U	6	U	6	U
trans-1,3-Dichloropropene	10	6	U	6	U	6	U	6	U	6	U	5	U	6	U	6	U
Bromoform	10	6	U	6	U	6	U	6	U	6	U	5	U	6	U	6	U
4-Methyl-2-pentanone	10	10	UJ	10	U	11	U	10	U	11	U	10	U	11	U	11	U
2-Hexanone	10	10	UJ	10	U	10	U	10	U	11	U	10	U	11	U	11	U
Tetrachloroethene	10	6	U	6	U	6	U	6	U	6	U	5	U	6	U	6	U
1,1,2,2-Tetrachloroethane	10	6	U	6	U	6	U	6	U	6	U	5	U	6	U	6	U
Toluene	10	6	U	6	U	6	U	6	U	6	U	5	U	6	U	6	U
Chlorobenzene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Ethylbenzene	10	6	U	2	J	6	U	6	U	6	U	5	U	6	U	6	U
Styrene	10	10	U	10	U	6	U	10	U	6	U	5	U	6	U	6	U
Xylene	10	10	U	10	U	6	U	10	U	6	U	5	U	6	U	6	U
cis-1,2-Dichloroethene	10	6	U	6	U	6	U	6	U	6	U	5	U	6	U	6	U
trans-1,2-Dichloroethene	10	6	U	6	U	6	U	6	U	6	U	5	U	6	U	6	U

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize mis-interpretation of results. All other qualifiers shown were applied during validation.

VOLATILE ORGANIC ANALYSIS, SOIL MATRIX (UG/KG)

Project: WASHINGTON CLOSURE HANFORD																
Laboratory: LLI																
Case:	SDG: K0321															
Sample Number		J11VW5		J11VW5R		J11VW6		J11VW6R								
Remarks				Reprep				Reprep								
Sample Date		4/11/06		4/11/06		4/11/06		4/11/06								
Analysis Date		4/24/06		4/25/06		4/24/06		4/24/06								
VOA	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	11	U	11	UJ	11	U	11	UJ							
Bromomethane	10	11	U	11	UJ	11	U	11	UJ							
Vinyl Chloride	10	11	U	11	UJ	11	U	11	UJ							
Chloroethane	10	11	U	11	UJ	11	U	11	UJ							
Methylene Chloride	10	22	U	15	UJ	22	U	20	UJ							
Acetone	10	11	U	10	UJ	11	U	11	UJ							
Carbon Disulfide	10	6	U	6	UJ	6	U	6	UJ							
1,1-Dichloroethene	10	6	U	6	UJ	6	U	6	UJ							
1,1-Dichloroethane	10	6	U	6	UJ	6	U	6	UJ							
1,2-Dichloroethene (total)	10	6	U	6	UJ	6	U	6	UJ							
Chloroform	10	10	U	10	UJ	10	U	10	UJ							
1,2-Dichloroethane	10	6	U	6	UJ	6	U	6	UJ							
2-Butanone	10	11	U	11	UJ	11	U	11	UJ							
1,1,1-Trichloroethane	10	6	U	6	UJ	6	U	6	UJ							
Carbon Tetrachloride	10	6	U	6	UJ	6	U	6	UJ							
Bromodichloromethane	10	6	U	6	UJ	6	U	6	UJ							
1,2-Dichloropropane	10	6	U	6	UJ	6	U	6	UJ							
cis-1,3-Dichloropropene	10	6	U	6	UJ	6	U	6	UJ							
Trichloroethene	10	6	U	6	UJ	6	U	6	UJ							
Dibromochloromethane	10	6	U	6	UJ	6	U	6	UJ							
1,1,2-Trichloroethane	10	6	U	6	UJ	6	U	6	UJ							
Benzene	10	6	U	6	UJ	6	U	6	UJ							
trans-1,3-Dichloropropene	10	6	U	6	UJ	6	U	6	UJ							
Bromoform	10	6	U	6	UJ	6	U	6	UJ							
4-Methyl-2-pentanone	10	11	U	10	UJ	11	U	11	UJ							
2-Hexanone	10	11	U	10	UJ	11	U	10	UJ							
Tetrachloroethene	10	6	U	6	UJ	6	U	6	UJ							
1,1,2,2-Tetrachloroethane	10	6	U	6	UJ	6	U	6	UJ							
Toluene	10	6	U	6	UJ	6	U	6	UJ							
Chlorobenzene	10	10	U	10	UJ	10	U	10	UJ							
Ethylbenzene	10	6	U	6	UJ	6	U	6	UJ							
Styrene	10	6	U	6	UJ	6	U	6	UJ							
Xylene	10	6	U	6	UJ	6	U	6	UJ							
M&P Xylene	10	6	U	6	UJ	6	U	6	UJ							
O-Xylene	10	6	U	6	UJ	6	U	6	UJ							
cis-1,2-Dichloroethene	10	6	U	6	UJ	6	U	6	UJ							
trans-1,2-Dichloroethene	10	6	U	6	UJ	6	U	6	UJ							

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize mis-interpretation of results. All other qualifiers shown were applied during validation.

	Cust ID:	J11VW0	J11VW0	J11VW1	J11VW1	J11VW2	J11VW2
Sample Information	RFW#:	001	001	002	002	003	003 MS
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	0.980	0.962	0.962	0.980	0.980	0.980
	Units:	ug/Kg	ug/Kg REPREP	ug/Kg	ug/Kg REPREP	ug/Kg	ug/Kg
Surrogate Recovery	Toluene-d8	133 %	146 * %	141 * %	165 * %	120 %	123 %
	Bromofluorobenzene	132 * %	142 * %	142 * %	155 * %	130 * %	121 %
	1,2-Dichloroethane-d4	153 * %	174 * %	164 * %	182 * %	140 %	153 * %
Chloromethane		11 U	11 U	11 U	11 U	11 U	115 %
Bromomethane		11 U	11 U	11 U	11 U	11 U	151 %
Vinyl Chloride		11 U	11 U	11 U	11 U	11 U	105 %
Chloroethane		11 U	11 U	11 U	11 U	11 U	123 %
Methylene Chloride		18 JB U	30 JB U	16 JB U	34 JB U	15 JB U	98 %
Acetone		11 U	11 U	11 U	11 U	10 JB U	199 %
Carbon Disulfide		6 U	6 U	6 U	6 U	6 U	116 %
1,1-Dichloroethene		6 U	6 U	6 U	6 U	6 U	119 %
1,1-Dichloroethane		6 U	6 U	6 U	6 U	6 U	135 %
1,2-Dichloroethene (total)		6 U	6 U	6 U	6 U	6 U	109 %
Chloroform		10 JB U	10 JB U	10 JB U	10 JB U	10 JB U	124 %
1,2-Dichloroethane		6 U	6 U	6 U	6 U	6 U	161 * %
2-Butanone		11 U	11 U	11 U	11 U	11 U	144 %
1,1,1-Trichloroethane		6 U	6 U	6 U	6 U	6 U	161 * %
Carbon Tetrachloride		6 U	6 U	6 U	6 U	6 U	166 * %
Bromodichloromethane		6 U	6 U	6 U	6 U	6 U	140 %
1,2-Dichloropropane		6 U	6 U	6 U	6 U	6 U	128 %
cis-1,3-Dichloropropene		6 U	6 U	6 U	6 U	6 U	129 %
Trichloroethene		6 U	6 U	6 U	6 U	6 U	131 %
Dibromochloromethane		6 U	6 U	6 U	6 U	6 U	159 * %
1,1,2-Trichloroethane		6 U	6 U	6 U	6 U	6 U	131 * %
Benzene		6 U	6 U	6 U	6 U	6 U	117 %
Trans-1,3-Dichloropropene		6 U	6 U	6 U	6 U	6 U	123 %
Bromoform		6 U	6 U	6 U	6 U	6 U	143 * %
4-Methyl-2-pentanone		10 JB U	10 JB U	11 U	10 JB U	11 U	125 %
2-Hexanone		10 JB U	10 JB U	10 JB U	10 JB U	11 U	133 %
Tetrachloroethene		6 U	6 U	6 U	6 U	6 U	147 * %
1,1,2,2-Tetrachloroethane		6 U	6 U	6 U	6 U	6 U	137 * %
Toluene		6 U	6 U	6 U	6 U	6 U	126 %

*= Outside of EPA CLP QC limits.

6/21/06

000014

RFW Batch Number: 0604L780 Client: ENGHANFORD RC-032 K0341 Work Order: 11343606001 Page: 1D

	Cust ID:	J11VW0	J11VW0	J11VW1	J11VW1	J11VW2	J11VW2	
	RFW#:	001	001 REPREP	002	002 REPREP	003	003 MS	
Chlorobenzene		103 JB U	105 JB U	104 JB U	104 JB U	102 JB U	107	%
Ethylbenzene		6 U	2 J	6 U	6 U	6 U	128	%
Styrene		101 JB U	103 JB U	6 U	101 JB U	6 U	93	%
Xylene (total)		103 JB U	105 JB U	6 U	101 JB U	6 U	119	%
cis-1,2-dichloroethene		6 U	6 U	6 U	6 U	6 U	111	%
trans-1,2-dichloroethene		6 U	6 U	6 U	6 U	6 U	108	%

*= Outside of EPA CLP QC limits.

000015

6/21/06

	Cust ID:	J11VW2	J11VW3	J11VW4	J11VW4	J11VW5	J11VW5
Sample Information	RFW#:	003 MSD	004	005	005	006	006
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	0.962	0.943	0.980	1.00	0.962	0.962
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg REPREP	ug/Kg	ug/Kg REPREP
Surrogate Recovery	Toluene-d8	116 %	112 %	119 %	149 * %	132 %	132 %
	Bromofluorobenzene	120 %	121 %	122 %	148 * %	127 * %	143 * %
	1,2-Dichloroethane-d4	152 * %	135 %	142 %	178 * %	146 %	160 * %
		fl	fl	fl	fl	fl	fl
Chloromethane		109 %	10 U	11 U	11 U	11 U	11 U J
Bromomethane		156 %	10 U	11 U	11 U	11 U	11 U
Vinyl Chloride		107 %	10 U	11 U	11 U	11 U	11 U
Chloroethane		122 %	10 U	11 U	11 U	11 U	11 U
Methylene Chloride		93 %	12 B U	21 B U	30 B U	22 B U	15 B U
Acetone		218 %	10 U	11 U	11 U	11 U	10 JB U
Carbon Disulfide		114 %	5 U	6 U	6 U	6 U	6 U
1,1-Dichloroethene		120 %	5 U	6 U	6 U	6 U	6 U
1,1-Dichloroethane		133 %	5 U	6 U	6 U	6 U	6 U
1,2-Dichloroethene (total)		111 %	5 U	6 U	6 U	6 U	6 U
Chloroform		123 %	10 JB U	10 JB U	10 JB U	10 JB U	10 JB U
1,2-Dichloroethane		162 * %	5 U	6 U	6 U	6 U	6 U
2-Butanone		165 %	10 U	11 U	11 U	11 U	11 U
1,1,1-Trichloroethane		162 * %	5 U	6 U	6 U	6 U	6 U
Carbon Tetrachloride		166 * %	5 U	6 U	6 U	6 U	6 U
Bromodichloromethane		144 * %	5 U	6 U	6 U	6 U	6 U
1,2-Dichloropropane		127 %	5 U	6 U	6 U	6 U	6 U
cis-1,3-Dichloropropene		124 %	5 U	6 U	6 U	6 U	6 U
Trichloroethene		134 %	5 U	6 U	6 U	6 U	6 U
Dibromochloromethane		152 * %	5 U	6 U	6 U	6 U	6 U
1,1,2-Trichloroethane		125 %	5 U	6 U	6 U	6 U	6 U
Benzene		118 %	5 U	6 U	6 U	6 U	6 U
Trans-1,3-Dichloropropene		123 %	5 U	6 U	6 U	6 U	6 U
Bromoform		145 * %	5 U	6 U	6 U	6 U	6 U
4-Methyl-2-pentanone		130 %	10 U	11 U	11 U	11 U	10 JB U
2-Hexanone		140 %	10 U	11 U	11 U	11 U	10 JB U
Tetrachloroethene		141 * %	5 U	6 U	6 U	6 U	6 U
1,1,2,2-Tetrachloroethane		140 * %	5 U	6 U	6 U	6 U	6 U
Toluene		123 %	5 U	6 U	6 U	6 U	6 U

*= Outside of EPA CLP QC limits.

6/21/06

0000016

Cust ID:	J11VW2		J11VW3	J11VW4	J11VW4	J11VW5	J11VW5
RFW#:	003 MSD		004	005	005 REPREP	006	006 REPREP
Chlorobenzene	105	%	10 ~~2 JB~~ U	10 ~~3 JB~~ U	10 ~~5 JB~~ U	10 ~~3 JB~~ U	10 ~~3 JB~~ U
Ethylbenzene	100	%	5 U	6 U	6 U	6 U	6 U
Styrene	96	%	5 U	6 U	6 U	6 U	6 U
Xylene (total)	114	%	5 U	6 U	6 U	6 U	6 U
cis-1,2-dichloroethene	111	%	5 U	6 U	6 U	6 U	6 U
trans-1,2-dichloroethene	110	%	5 U	6 U	6 U	6 U	6 U

*= Outside of EPA CLP QC limits.

6/21/9?

	Cust ID:	J11VW6	J11VW6	VBLKXL	VBLKXL BS	VBLKXR	VBLKXR BS
Sample Information	RFW#:	007	007	06LVK062-MB1	06LVK062-MB1	06LVK063-MB1	06LVK063-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	0.962	0.962	1.00	1.00	1.00	1.00
	Units:	ug/Kg	ug/Kg REPREP	ug/Kg	ug/Kg	ug/Kg	ug/Kg
	Toluene-d8	127 %	169 * %	117 %	108 %	109 %	130 %
Surrogate Recovery	Bromofluorobenzene	139 * %	164 * %	122 %	109 %	120 %	116 %
	1,2-Dichloroethane-d4	146 %	174 * %	140 %	134 %	138 %	142 %
Chloromethane		11 U	11 U J	10 U	77 %	10 U	84 %
Bromomethane		11 U	11 U	10 U	113 %	10 U	91 %
Vinyl Chloride		11 U	11 U	10 U	77 %	10 U	85 %
Chloroethane		11 U	11 U	10 U	95 %	10 U	98 %
Methylene Chloride		22 U	20 U	8	60 %	10	69 %
Acetone		11 U	11 U	3 J	172 %	4 J	159 %
Carbon Disulfide		6 U	6 U	5 U	94 %	5 U	103 %
1,1-Dichloroethene		6 U	6 U	5 U	94 %	5 U	104 %
1,1-Dichloroethane		6 U	6 U	5 U	106 %	5 U	116 %
1,2-Dichloroethene (total)		6 U	6 U	5 U	91 %	5 U	101 %
Chloroform		10 JBU	10 BJ U	2 J	98 %	2 J	109 %
1,2-Dichloroethane		6 U	6 U	5 U	128 %	5 U	143 * %
2-Butanone		11 U	11 U	10 U	125 %	1 J	117 %
1,1,1-Trichloroethane		6 U	6 U	5 U	129 %	5 U	138 %
Carbon Tetrachloride		6 U	6 U	5 U	136 %	5 U	140 %
Bromodichloromethane		6 U	6 U	5 U	115 %	5 U	126 %
1,2-Dichloropropane		6 U	6 U	5 U	100 %	5 U	112 %
cis-1,3-Dichloropropene		6 U	6 U	5 U	98 %	5 U	130 %
Trichloroethene		6 U	6 U	5 U	114 %	5 U	124 %
Dibromochloromethane		6 U	6 U	5 U	116 %	5 U	153 * %
1,1,2-Trichloroethane		6 U	6 U	5 U	92 %	5 U	125 %
Benzene		6 U	6 U	5 U	99 %	5 U	110 %
Trans-1,3-Dichloropropene		6 U	6 U	5 U	95 %	5 U	131 * %
Bromoform		6 U	6 U	5 U	111 %	5 U	150 * %
4-Methyl-2-pentanone		11 U	11 U	3 J	89 %	2 J	117 %
2-Hexanone		11 U	10 BJ U	2 J	106 %	3 J	142 %
Tetrachloroethene		6 U	6 U	5 U	116 %	5 U	144 * %
1,1,2,2-Tetrachloroethane		6 U	6 U	5 U	85 %	5 U	104 %
Toluene		6 U	6 U	5 U	101 %	5 U	130 %

*= Outside of EPA CLP QC limits.

6/21/06

000018

AAAAAAA11

Cust ID:	J11VW6	J11VW6	VBLKXL	VBLKXL BS	VBLKXR	VBLKXR BS
RFW#:	007	007 REPREP	06LVK062-MB1	06LVK062-MB1	06LVK063-MB1	06LVK063-MB1
Chlorobenzene	~~3 JB~~ 10 U	~~5 BJ~~ 10 UJ	3 J	92 %	3 J	119 %
Ethylbenzene	6 U	6 U	5 U	102 %	5 U	127 %
Styrene	6 U	6 U	2 J	90 %	1 J	122 %
Xylene (total)	6 U	6 U	2 J	93 %	2 J	122 %
cis-1,2-dichloroethene	6 U	6 U	5 U	90 %	5 U	101 %
trans-1,2-dichloroethene	6 U	6 U	5 U	93 %	5 U	101 %

*= Outside of EPA CLP QC limits.

6/21/02

000019

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-032
LVL #: 0604L780
SDG/SAF # K0321/RC-032

W.O. #: 11343-606-001-9999-00
Date Received: 04-14-2006

GC/MS VOLATILE

Seven (7) soil samples were collected on 04-11-2006.

The samples and their associated QC samples were analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8260B for TCL volatile target compounds on 04-24,25-2006.

The following is a summary of QC results accompanying the sample results. Lionville Laboratory Inc (LvLI) certifies that all test results meet the requirements of NELAC except as noted below:

1. Samples were analyzed within required holding time.

2. Non-target compounds were detected in the samples.

3. Twenty-four (24) of fifty-four (54) surrogate recoveries were outside acceptance criteria. The analysis of associated matrix spike samples fulfills the reanalysis requirement of sample J11VW2. All other out of criteria samples were reanalyzed on 04-24,25-2006 and reported.

4. Sixteen (16) of seventy (70) matrix spike recoveries were outside acceptance criteria.

5. Five (5) of seventy (70) blank spike recoveries were outside acceptance criteria.

6. The method blanks contained the common laboratory contaminants Methylene Chloride and Acetone at levels less than 3x the CRQL and the target compounds Chloroform, 2-Hexanone, 4-Methyl-2-pentanone, Chlorobenzene, Xylene (total) and Styrene at levels less than the CRQL. The method blank 06LVK063-MB1 also contained the target compound 2-Butanone at a level less than the CRQL.

7. Internal standard area criteria were not met for samples J11VW0, J11VW1, J11VW6 and J11VW4 RE. The initial sample analysis fulfills the reanalysis requirement of sample J11VW4 RE. All other out of criteria samples were reanalyzed on 04-24,25-2006 and reported.

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

8. Manual integrations are performed according to SOP QA-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").

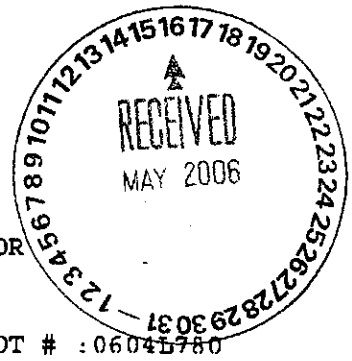
9. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

10. "I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

5/1/06
Date

som\group\data\voa\tmu-hanford\0604-780.doc



Lionville Laboratory, Inc.
VOA ANALYTICAL DATA PACKAGE FOR
TNUHANFORD RC-032 K0321

DATE RECEIVED: 04/14/06 LVL LOT # :0604L780

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
J11VW0	001	S	06LVK062	04/11/06	N/A	04/24/06
J11VW0	001 R1	S	06LVK062	04/11/06	N/A	04/24/06
J11VW1	002	S	06LVK062	04/11/06	N/A	04/24/06
J11VW1	002 R1	S	06LVK062	04/11/06	N/A	04/24/06
J11VW2	003	S	06LVK062	04/11/06	N/A	04/24/06
J11VW2	003 MS	S	06LVK062	04/11/06	N/A	04/24/06
J11VW2	003 MSD	S	06LVK062	04/11/06	N/A	04/24/06
J11VW3	004	S	06LVK062	04/11/06	N/A	04/24/06
J11VW4	005	S	06LVK062	04/11/06	N/A	04/24/06
J11VW4	005 R1	S	06LVK062	04/11/06	N/A	04/24/06
J11VW5	006	S	06LVK062	04/11/06	N/A	04/24/06
J11VW5	006 R1	S	06LVK063	04/11/06	N/A	04/25/06
J11VW6	007	S	06LVK062	04/11/06	N/A	04/24/06
J11VW6	007 R1	S	06LVK063	04/11/06	N/A	04/25/06
LAB QC:						
VBLKXL	MB1	S	06LVK062	N/A	N/A	04/24/06
VBLKXL	MB1 BS	S	06LVK062	N/A	N/A	04/24/06
VBLKXR	MB1	S	06LVK063	N/A	N/A	04/25/06
VBLKXR	MB1 BS	S	06LVK063	N/A	N/A	04/25/06

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-032-034	Page 2 of 3

Collector: Coffman	Company Contact: R.T. Coffman / Telephone No.: 528-6409	Project Coordinator: KESSNER, JH	Price Code / Data Turnaround: 15 DAY
Project Designation: 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location: 128-F-3 Verification	SAF No.: RC-032	Air Quality ☐
Ice Chest No.: AFS-04-120	Field Logbook No.: EFL-1174-1 / COA: R128F38000	Method of Shipment: Fed Ex	
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: ~~R128F32000~~ RTC 4/11/06 A060355	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

Cool 4 degrees C

000024

Preservation				None	Cool 4C	Cool 4C	Cool 4C					
Type of Container				G/P	aG	aG	aG					
No. of Container(s)				1	1	1	1					
Volume				250mL	60mL	120mL	125mL					
SAMPLE ANALYSIS				See item (1) in Special Instructions.	Chromium Hex - 7196	VOA - 8260A (TCL)	Pesticides - 8081					
Sample No.	Matrix *	Sample Date	Sample Time									
J11VW0	SOIL	4/11/06	0815	X	X	X	X					F3-6
J11VW1	SOIL		0815	X	X	X	X					F3-6D
J11VW2	SOIL		0825	X	X	X	X					F3-7
J11VW3	SOIL		0835	X	X	X	X					F3-8
J11VW4	SOIL	4/11/06	0845	X	X	X	X					F3-9

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
RTCoffman/RT Coffman	4/11/06 1430	Refer #2C 3728	4/11/06 1430
3728 #2C	4-12-06 1130	[illegible]	4-12-06 1130
[illegible] WCH	4-12-06 1500	FED EX	
FedEx		[illegible]	4/14/06 0925

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7471 - (CV)

Personnel not available to relinquish samples from 3728 Ref # 2C on 4/12/06

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (08/29/2005)

0000000028

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		RC-032-034	Page 1 of 1
Collector Coffman	Company Contact R.T. Coffman	Telephone No. 528-6409	Project Coordinator KESSNER, JH	Price Code / Data Turnaround Air Quality ☐ 15 DAY
Project Designation 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location 128-F-3 Verification		SAF No. RC-032	
Ice Chest No. AFS-04-120	Field Logbook No. EFL-1174-1	COA R128F32000	Method of Shipment Fed Ex	
Shipped To EBERLINE SERVICES/LIONVILLE	Offsite Property No. ~~R128F32000~~ RTC 4/11/06 A060355		Bill of Lading/Air Bill No. SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

Cool 4 degrees C

Preservation	None	Cool 4C	Cool 4C	Cool 4C							
Type of Container	G/P	aG	aG	aG							
No. of Container(s)	1	1	1	1							
Volume	250mL	60mL	120mL	125mL							

S20025 000000

SAMPLE ANALYSIS				See item (1) in Special Instructions.	Chromium Hex - 7196	VOA - 8260A (TCL)	Pesticides - 8081						
Sample No.	Matrix *	Sample Date	Sample Time										
J11VW5	SOIL	4/11/06	0855	X	X	X	X						F3-10
J11VW6	SOIL	4/11/06	0905	X	X	X	X						F3-SP

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
RTCoffman/RTCoffman	4/11/06 1430	Rege #2C 3728	4/11/06 1430
3728 #2C	4-12-06 1130	TR Edmundson	4-12-06 1130
TR Edmundson	4-12-06 1500	FED EX	
FedEx		JPlumm	4/14/06 0925

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV)

Personnel not available to relinquish samples from 3728 Ref #2C on 4/12/06

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (08/29/2005)

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100 F 128-F-3			DATA PACKAGE: K0321		
VALIDATOR: TLI		LAB: LLI		DATE: 6/5/06	
			SDG: K0321		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J11VW0 J11VW1 J11VW2 J11VW3					
J11VW4 J11VW5					
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes (No) N/A

Comments: _____

2. INSTRUMENT TUNING AND CALIBRATION (Levels D and E)

GC/MS tuning/performance check acceptable? ..... Yes No (N/A)

Initial calibrations acceptable? ..... Yes No (N/A)

Continuing calibrations acceptable? ..... Yes No (N/A)

Standards traceable? ..... Yes No (N/A)

Standards expired? ..... Yes No (N/A)

Calculation check acceptable? ..... Yes No (N/A)

Comments: _____

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

Calibration blanks analyzed? (Levels D, E) ..... Yes No (N/A)
Calibration blank results acceptable? (Levels D, E) ..... Yes No (N/A)
Laboratory blanks analyzed? ..... (Yes) No N/A
Laboratory blank results acceptable? ..... Yes (No) N/A
Field/trip blanks analyzed? (Levels C, D, E) ..... Yes (No) N/A
Field/trip blank results acceptable? (Levels C, D, E) ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)

Comments: no FB
methylene chloride - all U at ~~RQL (XPT OR LCS + 4R)~~ RQL
acetone - W2 + WSR - U at RQL
chloroform - U at RQL - all
4-methyl-2-pentanone + 2hexanone - U at RQL - all detects
chlorobenzene styrene xylene ——— /

4. ACCURACY (Levels C, D, and E)

Surrogates/system monitoring compounds analyzed? ..... (Yes) No N/A
Surrogate/system monitoring compound recoveries acceptable? ..... Yes (No) N/A
Surrogates traceable? (Levels D, E) ..... Yes No (N/A)
Surrogates expired? (Levels D, E) ..... Yes No (N/A)
MS/MSD samples analyzed? ..... (Yes) No N/A
MS/MSD results acceptable? ..... (Yes) No N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No (N/A)
MS/MSD standards? (Levels D, E) ..... Yes No (N/A)
LCS/BSS samples analyzed? ..... (Yes) No N/A
LCS/BSS results acceptable? ..... (Yes) No N/A
Standards traceable? (Levels D, E) ..... Yes No (N/A)
Standards expired? (Levels D, E) ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)
Performance audit sample(s) analyzed? ..... Yes (No) N/A
Performance audit sample results acceptable? ..... Yes No (N/A)

Comments: WOR, W1, W1R, W4Rd w1R - Surr - J all detects
WO - J - ~~chloroform~~ 4methyl-2pentanone ~~surr~~ 2-hexanone - Surr
WSR - J " " " "

NO MS/MSD for 5R + 6R - J all no PAS

GC/MS ORGANIC DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

MS/MSD samples analyzed? ..... (Yes) No N/A
MS/MSD RPD values acceptable? ..... (Yes) No N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No (N/A)
MS/MSD standards expired? (Levels D, E) ..... Yes No (N/A)
Field duplicate RPD values acceptable? ..... (Yes) No N/A
Field split RPD values acceptable? ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)
Comments: NO MS/MSD for 5R + 6R - Jall

6. SYSTEM PERFORMANCE (Levels D and E)

Internal standards analyzed? ..... Yes No (N/A)
Iinternal standard areas acceptable? ..... Yes No (N/A)
Internal standard retention times acceptable? ..... Yes No (N/A)
Standards traceable? ..... Yes No (N/A)
Standards expired? ..... Yes No (N/A)
Transcription/calculation errors? ..... Yes No (N/A)
Comments:

7. HOLDING TIMES (all levels)

Samples properly preserved? ..... (Yes) No N/A
Sample holding times acceptable? ..... (Yes) No N/A
Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Compound identification acceptable? (Levels D, E)	Yes	No	(N/A)
Compound quantitation acceptable? (Levels D, E)	Yes	No	(N/A)
Results reported for all requested analyses?	(Yes)	No	N/A
Results supported in the raw data? (Levels D, E)	Yes	No	(N/A)
Samples properly prepared? (Levels D, E)	Yes	No	(N/A)
Laboratory properly identified and coded all TIC? (Levels D, E)	Yes	No	(N/A)
Detection limits meet RDL?	Yes	(No)	N/A
Transcription/calculation errors? (Levels D, E)	Yes	No	(N/A)

Comments:

44 + 10 + 18 + 12 = 74 ave

9. SAMPLE CLEANUP (Levels D and E)

GPC cleanup performed?	Yes	No	(N/A)
GPC check performed?	Yes	No	(N/A)
GPC check recoveries acceptable?	Yes	No	(N/A)
GPC calibration performed?	Yes	No	(N/A)
GPC calibration check performed?	Yes	No	(N/A)
GPC calibration check retention times acceptable?	Yes	No	(N/A)
Check/calibration materials traceable?	Yes	No	(N/A)
Check/calibration materials Expired?	Yes	No	(N/A)
Analytical batch QC given similar cleanup?	Yes	No	(N/A)
Transcription/Calculation Errors?	Yes	No	(N/A)

Comments:

Date: 21 June 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-F Remaining Sites Burial Grounds – Soil Full Protocol - Waste Site 128-F-3
Subject: Inorganic - Data Package No. K0321-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0321 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
J11VW0	4/11/06	Soil	C	See note 1
J11VW1	4/11/06	Soil	C	See note 1
J11VW2	4/11/06	Soil	C	See note 1
J11VW3	4/11/06	Soil	C	See note 1
J11VW4	4/11/06	Soil	C	See note 1
J11VW5	4/11/06	Soil	C	See note 1
J11VW6	4/11/06	Soil	C	See note 1

1- ICP metals (6010B) and mercury (7471A).

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, February 2005). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by Client

DATA QUALITY PARAMETERS

- **Holding Times**

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 28 days for mercury and 6 months for ICP metals.

All holding times were acceptable.

- **Preparation (Method) Blanks**

Preparation Blanks

At least one preparation blank, consisting of deionized distilled water processed through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "U". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the contract required detection limit (CRDL), all nondetects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the instrument detection limit (IDL) and less than or equal to the CRDL, all nondetects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are greater than ten times the absolute value of the preparation blank, no qualification is necessary.

Due to method blank contamination, the silver result in sample J11VW5 was qualified as an estimate and flagged "UJ".

All other preparation blank results were acceptable.

Field (Equipment) Blank

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 130% and a sample result less

than the IDL, no qualification is required.

Due to a matrix spike recovery outside QC limits (59.5%), all antimony results were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits (43.1%), all silicon results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J11VW0/J11VW1) were submitted for analysis. Field duplicates are assessed using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 100 Area RQLs to ensure that laboratory detection levels meet the required criteria. All undetected selenium and silver results exceeded the RQL. All cadmium results in samples J11VW2, J11VW3 and J11VW5 exceeded the RQL. Under the WCH statement of work, no qualification is required. All other results met the RQL.

- **Completeness**

Data package No. K0321 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to method blank contamination, the silver result in sample J11VW5 was qualified as an estimate and flagged "UJ".
- Due to a matrix spike recovery outside QC limits (45.1%), all antimony results were qualified as estimates and flagged "J".
- Due to an LCS recovery outside QC limits (54.8%), all silicon results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

All undetected selenium and silver results exceeded the RQL. All cadmium results in samples J11VW2, J11VW3 and J11VW5 exceeded the RQL. Under the WCH statement of work, no qualification is required.

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with BHI validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

METALS DATA QUALIFICATION SUMMARY*

SDG: K0321	REVIEWER: TLI	Project: 1.28 F-3	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Silver	UJ	J11VW5	Blank contamination
Antimony	J	All	MS recovery
Silicon	J	All	LCS recovery

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: WASHINGTON CLOSURE HANFORD															
Lab: LLI	SDG: K0321														
Sample Number		J11VW0		J11VW1		J11VW2		J11VW3		J11VW4		J11VW5		J11VW6	
Remarks				Duplicate											
Sample Date		4/11/06		4/11/06		4/11/06		4/11/06		4/11/06		4/11/06		4/11/06	
Inorganics	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Silver	0.2	0.23	U	0.23	U	0.22	U	0.22	U	0.22	U	0.28	UJ	0.23	U
Aluminum		5980		6360		5510		4540		7100		5770		5930	
Arsenic	10	2.0		2.6		2.3		2.3		2.4		2.6		2.0	U
Boron		11.4		13.2		2.4		0.88		21.8		5.4		5.5	
Barium	2	214		235		60.7		36.7		290		98.2		141	
Beryllium		0.50		0.54		0.32		0.29		0.62		0.41		0.58	
Calcium		5840		6050		3070		2420		6140		3390		3870	
Cadmium	0.2	0.25		0.26		0.22	U	0.22	U	0.25		0.23	U	0.27	
Cobalt		7.2		7.2		5.2		4.7		6.6		5.5		6.6	
Chromium	1	13.7		14.8		12.6		8.9		10.2		13.1		9.8	
Copper		23.0		25.7		18.5		15.0		20.0		19.7		11.6	
Iron		18400		18400		12100		10900		17500		12700		18300	
Mercury	0.2	0.02	U	0.02		0.02	U	0.02	U	0.02		0.02	U	0.02	U
Potassium		1120		1110		852		676		1290		903		1340	
Magnesium		3620		3660		3660		3100		3730		3650		3440	
Manganese		327		326		234		219		304		239		331	
Molybdenum		0.94	U	0.96	U	0.92	U	0.90	U	0.92	U	0.94	U	0.96	U
Sodium		192		233		96.2		67.9		301		201		120	
Nickel		10.7		10.9		12.5		9.5		10.2		11.8		9.2	
Lead	5	5.2		5.7		3.4		3.1		4.7		3.5		8.3	
Antimony		1.4	UJ	1.5	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.5	UJ
Selenium	1	1.5	U	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Silicon		584	J	548	J	476	J	442	J	555	J	552	J	392	J
Vanadium		50.8		52.4		26.5		23.7		48.0		29.1		46.4	
Zinc	1	59.6		54.1		31.6		26.4		46.6		34.7		44.8	

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results. All other qualifiers shown were applied during validation.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/28/06

CLIENT: TNUHANFORD RC-032 K0321 LVL LOT #: 0604L780

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J11VW0	Silver, Total	0.23 u	MG/KG	0.23	3.0
		Aluminum, Total	5960	MG/KG	9.3	3.0
		Arsenic, Total	2.0	MG/KG	2.0	3.0
		Boron, Total	11.4	MG/KG	0.78	3.0
		Barium, Total	214	MG/KG	0.06	3.0
		Beryllium, Total	0.50	MG/KG	0.06	3.0
		Calcium, Total	5840	MG/KG	5.3	3.0
		Cadmium, Total	0.25	MG/KG	0.23	3.0
		Cobalt, Total	7.2	MG/KG	0.45	3.0
		Chromium, Total	13.7	MG/KG	0.42	3.0
		Copper, Total	23.0	MG/KG	0.39	3.0
		Iron, Total	18400	MG/KG	11.3	3.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1120	MG/KG	7.4	3.0
		Magnesium, Total	3620	MG/KG	3.1	3.0
		Manganese, Total	327	MG/KG	0.1	3.0
		Molybdenum, Total	0.94 u	MG/KG	0.94	3.0
		Sodium, Total	192	MG/KG	2.5	3.0
		Nickel, Total	10.7	MG/KG	0.78	3.0
		Lead, Total	5.2	MG/KG	1.0	3.0
		Antimony, Total	1.4 uJ	MG/KG	1.4	3.0
		Selenium, Total	1.5 u	MG/KG	1.5	3.0
		Silicon, Total	584 J	MG/KG	7.4	3.0
		Vanadium, Total	50.8	MG/KG	0.29	3.0
		Zinc, Total	59.6	MG/KG	0.52	3.0

R 4/21/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/28/06

CLIENT: TNUHANFORD RC-032 K0321 LVL LOT #: 0604L780

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	J11VW1	Silver, Total	0.23 u	MG/KG	0.23	3.0
		Aluminum, Total	6360	MG/KG	9.5	3.0
		Arsenic, Total	2.6	MG/KG	2.0	3.0
		Boron, Total	13.2	MG/KG	0.79	3.0
		Barium, Total	235	MG/KG	0.07	3.0
		Beryllium, Total	0.54	MG/KG	0.07	3.0
		Calcium, Total	6050	MG/KG	5.4	3.0
		Cadmium, Total	0.26	MG/KG	0.23	3.0
		Cobalt, Total	7.2	MG/KG	0.46	3.0
		Chromium, Total	14.8	MG/KG	0.43	3.0
		Copper, Total	25.7	MG/KG	0.40	3.0
		Iron, Total	18400	MG/KG	11.5	3.0
		Mercury, Total	0.02	MG/KG	0.02	1.0
		Potassium, Total	1110	MG/KG	7.5	3.0
		Magnesium, Total	3660	MG/KG	3.2	3.0
		Manganese, Total	326	MG/KG	0.1	3.0
		Molybdenum, Total	0.96 u	MG/KG	0.96	3.0
		Sodium, Total	233	MG/KG	2.5	3.0
		Nickel, Total	10.9	MG/KG	0.79	3.0
		Lead, Total	5.7	MG/KG	1.0	3.0
		Antimony, Total	1.5 u J	MG/KG	1.5	3.0
		Selenium, Total	1.6 u	MG/KG	1.6	3.0
		Silicon, Total	548 J	MG/KG	7.5	3.0
		Vanadium, Total	52.4	MG/KG	0.30	3.0
		Zinc, Total	54.1	MG/KG	0.53	3.0

6/21/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/28/06

CLIENT: TNUHANFORD RC-032 K0321 LVL LOT #: 0604L780

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
003	J11VW2	Silver, Total	0.22	u	MG/KG	0.22	3.0
		Aluminum, Total	5510		MG/KG	9.1	3.0
		Arsenic, Total	2.3		MG/KG	1.9	3.0
		Boron, Total	2.4		MG/KG	0.76	3.0
		Barium, Total	60.7		MG/KG	0.06	3.0
		Beryllium, Total	0.32		MG/KG	0.06	3.0
		Calcium, Total	3070		MG/KG	5.2	3.0
		Cadmium, Total	0.22	u	MG/KG	0.22	3.0
		Cobalt, Total	5.2		MG/KG	0.44	3.0
		Chromium, Total	12.6		MG/KG	0.41	3.0
		Copper, Total	18.5		MG/KG	0.38	3.0
		Iron, Total	12100		MG/KG	11.0	3.0
		Mercury, Total	0.02	u	MG/KG	0.02	1.0
		Potassium, Total	852		MG/KG	7.2	3.0
		Magnesium, Total	3660		MG/KG	3.1	3.0
		Manganese, Total	234		MG/KG	0.09	3.0
		Molybdenum, Total	0.92	u	MG/KG	0.92	3.0
		Sodium, Total	96.2		MG/KG	2.4	3.0
		Nickel, Total	12.5		MG/KG	0.76	3.0
		Lead, Total	3.4		MG/KG	0.98	3.0
		Antimony, Total	1.4	u J	MG/KG	1.4	3.0
		Selenium, Total	1.5	u	MG/KG	1.5	3.0
		Silicon, Total	476	J	MG/KG	7.2	3.0
		Vanadium, Total	26.5		MG/KG	0.28	3.0
		Zinc, Total	31.6		MG/KG	0.51	3.0

4/21/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/28/06

CLIENT: TNUHANFORD RC-032 K0321 LVL LOT #: 0604L780

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-004	J11VW3	Silver, Total	0.22	u	MG/KG	0.22	3.0
		Aluminum, Total	4540		MG/KG	8.9	3.0
		Arsenic, Total	2.3		MG/KG	1.9	3.0
		Boron, Total	0.88		MG/KG	0.75	3.0
		Barium, Total	36.7		MG/KG	0.06	3.0
		Beryllium, Total	0.29		MG/KG	0.06	3.0
		Calcium, Total	2420		MG/KG	5.1	3.0
		Cadmium, Total	0.22	u	MG/KG	0.22	3.0
		Cobalt, Total	4.7		MG/KG	0.43	3.0
		Chromium, Total	8.9		MG/KG	0.40	3.0
		Copper, Total	15.0		MG/KG	0.37	3.0
		Iron, Total	10900		MG/KG	10.8	3.0
		Mercury, Total	0.02	u	MG/KG	0.02	1.0
		Potassium, Total	676		MG/KG	7.0	3.0
		Magnesium, Total	3100		MG/KG	3.0	3.0
		Manganese, Total	219		MG/KG	0.09	3.0
		Molybdenum, Total	0.90	u	MG/KG	0.90	3.0
		Sodium, Total	67.9		MG/KG	2.4	3.0
		Nickel, Total	9.5		MG/KG	0.75	3.0
		Lead, Total	3.1		MG/KG	0.96	3.0
		Antimony, Total	1.4	uJ	MG/KG	1.4	3.0
		Selenium, Total	1.5	u	MG/KG	1.5	3.0
		Silicon, Total	442	J	MG/KG	7.0	3.0
		Vanadium, Total	23.7		MG/KG	0.28	3.0
		Zinc, Total	26.4		MG/KG	0.50	3.0

6/21/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/28/06

CLIENT: TNUHANFORD RC-032 K0321 LVL LOT #: 0604L780

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-005	J11VW4	Silver, Total	0.22	u	MG/KG	0.22	3.0
		Aluminum, Total	7100		MG/KG	9.2	3.0
		Arsenic, Total	2.4		MG/KG	1.9	3.0
		Boron, Total	21.8		MG/KG	0.76	3.0
		Barium, Total	290		MG/KG	0.06	3.0
		Beryllium, Total	0.62		MG/KG	0.06	3.0
		Calcium, Total	6140		MG/KG	5.2	3.0
		Cadmium, Total	0.25		MG/KG	0.22	3.0
		Cobalt, Total	6.6		MG/KG	0.45	3.0
		Chromium, Total	10.2		MG/KG	0.41	3.0
		Copper, Total	20.0		MG/KG	0.38	3.0
		Iron, Total	17500		MG/KG	11.1	3.0
		Mercury, Total	0.02		MG/KG	0.02	1.0
		Potassium, Total	1290		MG/KG	7.2	3.0
		Magnesium, Total	3730		MG/KG	3.1	3.0
		Manganese, Total	304		MG/KG	0.1	3.0
		Molybdenum, Total	0.92	u	MG/KG	0.92	3.0
		Sodium, Total	301		MG/KG	2.4	3.0
		Nickel, Total	10.2		MG/KG	0.76	3.0
		Lead, Total	4.7		MG/KG	0.99	3.0
		Antimony, Total	1.4	u J	MG/KG	1.4	3.0
		Selenium, Total	1.5	u	MG/KG	1.5	3.0
		Silicon, Total	555	J	MG/KG	7.2	3.0
		Vanadium, Total	48.0		MG/KG	0.29	3.0
		Zinc, Total	46.6		MG/KG	0.51	3.0

6/21/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/28/06

CLIENT: TNUHANFORD RC-032 K0321 LVL LOT #: 0604L780

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-006	J11VW5	Silver, Total	0.28 UJ	MG/KG	0.23	3.0
		Aluminum, Total	5770	MG/KG	9.3	3.0
		Arsenic, Total	2.6	MG/KG	2.0	3.0
		Boron, Total	5.4	MG/KG	0.77	3.0
		Barium, Total	98.2	MG/KG	0.06	3.0
		Beryllium, Total	0.41	MG/KG	0.06	3.0
		Calcium, Total	3390	MG/KG	5.3	3.0
		Cadmium, Total	0.23 u	MG/KG	0.23	3.0
		Cobalt, Total	5.5	MG/KG	0.45	3.0
		Chromium, Total	13.1	MG/KG	0.42	3.0
		Copper, Total	19.7	MG/KG	0.39	3.0
		Iron, Total	12700	MG/KG	11.3	3.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	903	MG/KG	7.3	3.0
		Magnesium, Total	3650	MG/KG	3.1	3.0
		Manganese, Total	239	MG/KG	0.1	3.0
		Molybdenum, Total	0.94 u	MG/KG	0.94	3.0
		Sodium, Total	201	MG/KG	2.5	3.0
		Nickel, Total	11.8	MG/KG	0.77	3.0
		Lead, Total	3.5	MG/KG	1.0	3.0
		Antimony, Total	1.4 u J	MG/KG	1.4	3.0
		Selenium, Total	1.5 u	MG/KG	1.5	3.0
		Silicon, Total	552 J	MG/KG	7.3	3.0
		Vanadium, Total	29.1	MG/KG	0.29	3.0
		Zinc, Total	34.7	MG/KG	0.52	3.0

4/21/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/28/06

CLIENT: TNUHANFORD RC-032 K0321 LVL LOT #: 0604L780

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-007	J11VW6	Silver, Total	0.23	u	MG/KG	0.23	3.0
		Aluminum, Total	5930		MG/KG	9.5	3.0
		Arsenic, Total	2.0	u	MG/KG	2.0	3.0
		Boron, Total	5.5		MG/KG	0.79	3.0
		Barium, Total	141		MG/KG	0.07	3.0
		Beryllium, Total	0.58		MG/KG	0.07	3.0
		Calcium, Total	3870		MG/KG	5.4	3.0
		Cadmium, Total	0.27		MG/KG	0.23	3.0
		Cobalt, Total	6.6		MG/KG	0.46	3.0
		Chromium, Total	9.8		MG/KG	0.43	3.0
		Copper, Total	11.6		MG/KG	0.40	3.0
		Iron, Total	18300		MG/KG	11.5	3.0
		Mercury, Total	0.02	u	MG/KG	0.02	1.0
		Potassium, Total	1340		MG/KG	7.5	3.0
		Magnesium, Total	3440		MG/KG	3.2	3.0
		Manganese, Total	331		MG/KG	0.1	3.0
		Molybdenum, Total	0.96	u	MG/KG	0.96	3.0
		Sodium, Total	120		MG/KG	2.5	3.0
		Nickel, Total	9.2		MG/KG	0.79	3.0
		Lead, Total	8.3		MG/KG	1.0	3.0
		Antimony, Total	1.5	u J	MG/KG	1.5	3.0
		Selenium, Total	1.5	u	MG/KG	1.5	3.0
		Silicon, Total	392	J	MG/KG	7.5	3.0
		Vanadium, Total	46.4		MG/KG	0.30	3.0
		Zinc, Total	44.8		MG/KG	0.53	3.0

4/21/06

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-032
LVL#: 0604L780
SDG/SAF#: K0321/RC-032

W.O.#: 11343-606-001-9999-00
Date Received: 04-14-06

METALS CASE NARRATIVE

The following is a summary of the QC results accompanying the sample results. Lionville Laboratory (LvLI) certifies that all test results meet the requirements of NELAC except as noted below.

All soil samples are reported on a dry weight basis unless requested by the client, required by the method, or noted otherwise.

1. This narrative covers the analyses of 7 soil samples.

2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary. All samples were reported with 3-fold dilutions for ICP metals due to high concentrations and sample matrix.

3. All analyses were performed within the required holding times.

4. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).

5. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).

6. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

7. All ICP Interference Check Standards were within control limits.

8. All laboratory control samples (LCS) were within the 80-120% control limits with the exception of Silicon at 43.1%. Refer to the Inorganics Laboratory Control Standards Report. Associated sample results may be biased low.

9. The matrix spike (MS) recoveries for 4 analytes were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

10. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A PDS was prepared at meaningful concentration level for the following analytes:

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J11VW0	Aluminum	66,000	97.4
	Iron	66,000	85.9
	Antimony	300	101.4
	Silicon	6,300	100.2

11. The duplicate analysis for 1 analyte was outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

12. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

13. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

14. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Judy Stone

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

5/1/06
Date

jjw/m04-780

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-032-034	Page 2 of 3

Collector	Company Contact / Telephone No.	Project Coordinator	Price Code / Data Turnaround
Coffman	R.T. Coffman 528-6409	KESSNER, JH	Air Quality ☐ 15 DAY

Project Designation	Sampling Location	SAF No.
100-F Remaining Sites Burial Grounds - Soil Full Protocol	128-F-3 Verification	RC-032

Ice Chest No.	Field Logbook No.	COA	Method of Shipment
AFS-04-120	EFL-1174-1	R128F30000	Fed Ex

Shipped To	Offsite Property No.	Bill of Lading/Air Bill No.
EBERLINE SERVICES / LIONVILLE	~~R128F32000~~ RTC 4/11/06 A060355	SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

Cool 4 degrees C

Preservation	None	Cool 4C	Cool 4C	Cool 4C						
Type of Container	G/P	aG	aG	aG						
No. of Container(s)	1	1	1	1						
Volume	250mL	60mL	120mL	125mL						

0000021

SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	VOA - 8260A (TCL)	Pesticides - 8081						

Sample No.	Matrix *	Sample Date	Sample Time										
J11VW0	SOIL	4/11/06	0815	X	X	X	X						F3-6
J11VW1	SOIL		0815	X	X	X	X						F3-6D
J11VW2	SOIL		0825	X	X	X	X						F3-7
J11VW3	SOIL		0835	X	X	X	X						F3-8
J11VW4	SOIL	4/11/06	0845	X	X	X	X						F3-9

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
RTCoffman/RTCoffman	4/11/06 1430	Ref# 2C, 3728	4/11/06 1430
3728#2C	4-12-06 1130	[illegible]	4/12/06 1130
[illegible] WCH	4/12/06 1500	FED EX	
FedEx		JHKNNY	4/14/06 0925

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7471 - (CV)

Personnel not available to relinquish samples from 3728 Ref# 2C on 4/12/06

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-032-034	Page 1 of 1

Collector	Company Contact / Telephone No.	Project Coordinator	Price Code / Data Turnaround
Coffman	R.T. Coffman 528-6409	KESSNER, JH	Air Quality ☐ 15 DAY
Project Designation	**Sampling Location**	**SAF No.**	
100-F Remaining Sites Burial Grounds - Soil Full Protocol	128-F-3 Verification	RC-032	
Ice Chest No. AFS-04-120	**Field Logbook No.** EFL-1174-1 / **COA** R128F32000	**Method of Shipment** Fed Ex	
Shipped To EBERLINE SERVICES/ LIONVILLE	**Offsite Property No.** ~~R128F32000~~ RTC 4/11/06 A060355	**Bill of Lading/Air Bill No.** SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

Cool 4 degrees C

0000022

Preservation	None	Cool 4C	Cool 4C	Cool 4C								
Type of Container	G/P	aG	aG	aG								
No. of Container(s)	1	1	1	1								
Volume	250mL	60mL	120mL	125mL								
SAMPLE ANALYSIS	See item (1) in Special Instructions	Chromium Hex - 7196	VOA - 8260A (TCL)	Pesticides - 8081								
Sample No.	**Matrix ***	**Sample Date**	**Sample Time**									
J11VW5	SOIL	4/11/06	0855	X	X	X	X					F3-10
J11VW6	SOIL	4/11/06	0905	X	X	X	X					F3-SP

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
RT Coffman/RT Coffman	4/11/06 1430	Rekk #2C, 3728	4/11/06 1430
3728 #2C	4-12-06 1130	TR Edmundson TR Edmundson	4-12-06 1130
TR Edmundson TR Edmundson	4-13-06 1500	FED EX	
Fed Ex		J Penny	4/14/06 0925

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV)

Personnel not available to relinquish samples from 3728 Ref #2C on 4/12/06

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

0000000026

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100F 25-F-3			DATA PACKAGE: K0321		
VALIDATOR: TCI		LAB: LCI		DATE: 6/9/06	
			SDG: K0321		
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MATRIX					
J11VW0 J11VW1 J11VW2 J11VW3 J11VW4 J11VW5					
~~J11VW5~~ J11VW6					
Soil					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes No N/A

Comments: _____

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations performed on all instruments? ..... Yes No N/A

Initial calibrations acceptable? ..... Yes No N/A

ICP interference checks acceptable? ..... Yes No N/A

ICV and CCV checks performed on all instruments? ..... Yes No N/A

ICV and CCV checks acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

ICB and CCB checks performed for all applicable analyses? (Levels D, E) ..... Yes No (N/A)
ICB and CCB results acceptable? (Levels D, E) ..... Yes No (N/A)
Laboratory blanks analyzed? ..... (Yes) No N/A
Laboratory blank results acceptable? ..... Yes (No) N/A
Field blanks analyzed? (Levels C, D, E) ..... Yes (No) N/A
Field blank results acceptable? (Levels C, D, E) ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)

Comments: Silver - UJ W3 no FB

4. ACCURACY (Levels C, D, and E)

MS/MSD samples analyzed? ..... (Yes) No N/A
MS/MSD results acceptable? ..... Yes (No) N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No (N/A)
MS/MSD standards expired? (Levels D, E) ..... Yes No (N/A)
LCS/BSS samples analyzed? ..... (Yes) No N/A
LCS/BSS results acceptable? ..... Yes (No) N/A
Standards traceable? (Levels D, E) ..... Yes No (N/A)
Standards expired? (Levels D, E) ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)
Performance audit sample(s) analyzed? ..... Yes (No) N/A
Performance audit sample results acceptable? ..... Yes No (N/A)

Comments: no PAS
MS - Antimony - J all
LCS - Silicon - J all

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable?	Yes	No	N/A
Duplicate results acceptable?	Yes	No	N/A
MS/MSD standards NIST traceable? (Levels D, E)	Yes	No	N/A
MS/MSD standards expired? (Levels D, E)	Yes	No	N/A
Field duplicate RPD values acceptable?	Yes	No	N/A
Field split RPD values acceptable?	Yes	No	N/A
Transcription/calculation errors? (Levels D, E)	Yes	No	N/A

Comments:_____

6. ICP QUALITY CONTROL (Levels D and E)

ICP serial dilution samples analyzed?	Yes	No	N/A
ICP serial dilution %D values acceptable?	Yes	No	N/A
ICP post digestion spike required?	Yes	No	N/A
ICP post digestion spike values acceptable?	Yes	No	N/A
Standards traceable?	Yes	No	N/A
Standards expired?	Yes	No	N/A
Transcription/calculation errors?	Yes	No	N/A

Comments:_____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

7. FURNACE AA QUALITY CONTROL (Levels D and E)

Duplicate injections performed as required?	Yes	No	N/A
Duplicate injection %RSD values acceptable?	Yes	No	N/A
Analytical spikes performed as required?	Yes	No	N/A
Analytical spike recoveries acceptable?	Yes	No	N/A
Standards traceable?	Yes	No	N/A
Standards expired?	Yes	No	N/A
MSA performed as required?	Yes	No	N/A
MSA results acceptable?	Yes	No	N/A
Transcription/calculation errors?	Yes	No	N/A

Comments:_____

8. HOLDING TIMES (all levels)

Samples properly preserved?	Yes	No	N/A
Sample holding times acceptable?	Yes	No	N/A

Comments:_____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses? .... (Yes) No N/A

Results supported in the raw data? (Levels D, E) .... Yes No (N/A)

Samples properly prepared? (Levels D, E) .... Yes No (N/A)

Detection limits meet RDL? .... Yes (No) N/A

Transcription/calculation errors? (Levels D, E) .... Yes No (N/A)

Comments: all selenium ~~over~~ all silver over
3 cadmium over

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 04/28/06

CLIENT: TNHANFORD RC-032 K0321 LVL LOT #: 0604L780

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	06L0251-MB1	Silver, Total	0.09		MG/KG	0.07	1.0
		Aluminum, Total	2.9	u	MG/KG	2.9	1.0
		Arsenic, Total	0.61	u	MG/KG	0.61	1.0
		Boron, Total	0.24	u	MG/KG	0.24	1.0
		Barium, Total	0.02		MG/KG	0.02	1.0
		Beryllium, Total	0.02	u	MG/KG	0.02	1.0
		Calcium, Total	2.1		MG/KG	1.6	1.0
		Cadmium, Total	0.07	u	MG/KG	0.07	1.0
		Cobalt, Total	0.14	u	MG/KG	0.14	1.0
		Chromium, Total	0.14		MG/KG	0.13	1.0
		Copper, Total	0.12	u	MG/KG	0.12	1.0
		Iron, Total	3.5	u	MG/KG	3.5	1.0
		Potassium, Total	5.1		MG/KG	2.3	1.0
		Magnesium, Total	0.97	u	MG/KG	0.97	1.0
		Manganese, Total	0.03	u	MG/KG	0.03	1.0
		Molybdenum, Total	0.29	u	MG/KG	0.29	1.0
		Sodium, Total	0.76	u	MG/KG	0.76	1.0
		Nickel, Total	0.24	u	MG/KG	0.24	1.0
		Lead, Total	0.31	u	MG/KG	0.31	1.0
		Antimony, Total	0.44	u	MG/KG	0.44	1.0
		Selenium, Total	0.47	u	MG/KG	0.47	1.0
		Silicon, Total	2.3	u	MG/KG	2.3	1.0
		Vanadium, Total	0.09	u	MG/KG	0.09	1.0
		Zinc, Total	0.49		MG/KG	0.16	1.0
BLANK1	06C0076-MB1	Mercury, Total	0.02	u	MG/KG	0.02	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 04/28/06

CLIENT: TNUHANFORD RC-032 K0321 LVL LOT #: 0604L780

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	J11VW0	Silver, Total	5.1	0.23u	5.4	94.4	3.0
		Aluminum, Total	7160	5980	216	543.8*	3.0
		Arsenic, Total	205	2.0	216	93.8	3.0
		Boron, Total	110	11.4	108	91.3	3.0
		Barium, Total	420	214	216	95.3	3.0
		Beryllium, Total	5.8	0.50	5.4	98.1	3.0
		Calcium, Total	8400	5840	2700	94.8	3.0
		Cadmium, Total	5.5	0.25	5.4	97.2	3.0
		Cobalt, Total	59.0	7.2	54.1	95.7	3.0
		Chromium, Total	34.4	13.7	21.6	95.8	3.0
		Copper, Total	51.2	23.0	27.0	104.4	3.0
		Iron, Total	19100	18400	108	644.1*	3.0
		Mercury, Total	0.18	0.02u	0.16	106.7	1.0
		Potassium, Total	3620	1120	2700	92.5	3.0
		Magnesium, Total	6300	3620	2700	99.1	3.0
		Manganese, Total	386	327	54.1	110.0*	3.0
		Molybdenum, Total	102	0.94u	108	94.8	3.0
		Sodium, Total	2660	192	2700	91.5	3.0
		Nickel, Total	62.5	10.7	54.1	95.7	3.0
		Lead, Total	56.6	5.2	54.1	95.0	3.0
		Antimony, Total	32.2	1.4 u	54.1	59.5	3.0
		Selenium, Total	198	1.5 u	216	91.8	3.0
		Silicon, Total	781	584	108	182.1*	3.0
		Vanadium, Total	102	50.8	54.1	95.4	3.0
		Zinc, Total	105	59.6	54.1	83.7	3.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 04/28/06

CLIENT: TNUHANFORD RC-032 K0321 LVL LOT #: 0604L780

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	J11VW0	Silver, Total	0.23u	0.23u	NC	3.0
		Aluminum, Total	5980	6920	14.6	3.0
		Arsenic, Total	2.0	2.4	18.2	3.0
		Boron, Total	11.4	13.4	16.1	3.0
		Barium, Total	214	239	11.3	3.0
		Beryllium, Total	0.50	0.55	8.5	3.0
		Calcium, Total	5840	6160	5.2	3.0
		Cadmium, Total	0.25	0.30	18.8	3.0
		Cobalt, Total	7.2	7.6	5.4	3.0
		Chromium, Total	13.7	13.8	0.73	3.0
		Copper, Total	23.0	22.8	0.87	3.0
		Iron, Total	18400	20200	9.1	3.0
		Mercury, Total	0.02u	0.02u	NC	1.0
		Potassium, Total	1120	1180	5.6	3.0
		Magnesium, Total	3620	3770	4.1	3.0
		Manganese, Total	327	356	8.7	3.0
		Molybdenum, Total	0.94u	0.95u	NC	3.0
		Sodium, Total	192	314	48.3	3.0
		Nickel, Total	10.7	10.9	1.9	3.0
		Lead, Total	5.2	5.0	3.9	3.0
		Antimony, Total	1.4 u	1.4 u	NC	3.0
		Selenium, Total	1.5 u	1.5 u	NC	3.0
		Silicon, Total	584	533	9.2	3.0
		Vanadium, Total	50.8	57.0	11.5	3.0
		Zinc, Total	59.6	53.2	11.3	3.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 04/28/06

CLIENT: TNUHANFORD RC-032 K0321 LVL LOT #: 0604L780

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	06L0251-LC1	Silver, LCS	47.4	50.0	MG/KG	94.8
		Aluminum, LCS	473	500	MG/KG	94.5
		Arsenic, LCS	906	1000	MG/KG	90.6
		Boron, LCS	463	500	MG/KG	92.6
		Barium, LCS	479	500	MG/KG	95.8
		Beryllium, LCS	23.8	25.0	MG/KG	95.2
		Calcium, LCS	2410	2500	MG/KG	96.2
		Cadmium, LCS	23.7	25.0	MG/KG	94.8
		Cobalt, LCS	238	250	MG/KG	95.0
		Chromium, LCS	48.1	50.0	MG/KG	96.2
		Copper, LCS	121	125	MG/KG	96.7
		Iron, LCS	482	500	MG/KG	96.4
		Potassium, LCS	2260	2500	MG/KG	90.6
		Magnesium, LCS	2320	2500	MG/KG	92.8
		Manganese, LCS	73.1	75.0	MG/KG	97.5
		Molybdenum, LCS	487	500	MG/KG	97.4
		Sodium, LCS	2250	2500	MG/KG	90.1
		Nickel, LCS	191	200	MG/KG	95.7
		Lead, LCS	236	250	MG/KG	94.5
		Antimony, LCS	278	300	MG/KG	92.8
		Selenium, LCS	871	1000	MG/KG	87.1
		Silicon, LCS	216	500	MG/KG	43.1
		Vanadium, LCS	239	250	MG/KG	95.5
		Zinc, LCS	93.1	100	MG/KG	93.1
LCS1	06C0076-LC1	Mercury, LCS	6.8	6.2	MG/KG	109.7

Date: 21 June 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-F Remaining Sites Burial Grounds – Soil Full Protocol - Waste Site 128-F-3
Subject: Pesticide - Data Package No. K0321-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0321 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J11VW0	4/11/06	Soil	C	Pesticides by8081
J11VW1	4/11/06	Soil	C	Pesticides by8081
J11VW2	4/11/06	Soil	C	Pesticides by8081
J11VW3	4/11/06	Soil	C	Pesticides by8081
J11VW4	4/11/06	Soil	C	Pesticides by8081
J11VW5	4/11/06	Soil	C	Pesticides by8081
J11VW6	4/11/06	Soil	C	Pesticides by8081

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, February 2005). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

- **Holding Times**

Sample data were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded by less than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detected sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

- **Method Blank**

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or analysis. At least one method blank analysis must be conducted for every 20 samples. Method blanks should not contain target compounds at a concentration greater than required quantitation limit (RQL). If target compounds are present, sample results less than five times the blank concentration are qualified as undetected and flagged "U". If the sample result is less than five times the blank concentration and less than RQL, the result is qualified as undetected and elevated to the RQL.

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike & Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data . The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Non-detected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

Due to the lack of a matrix spike, matrix spike duplicate or LCS analysis, all toxaphene results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

Surrogate Recovery

The analysis of surrogate compounds provides a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory. When a surrogate compound recovery is outside the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Non-detected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Non-detected compounds with surrogate recoveries above the upper control limit require no qualification.

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed as the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. For soil samples, results must be within RPD limits of plus/minus 30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

Due to the lack of a matrix spike or matrix spike duplicate analysis, all toxaphene results were qualified as estimates and flagged "J".

All other precision results were acceptable.

Field Duplicate Samples

One set of field duplicate samples (J11VW0/J11VW1) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 100 Area RQLs to ensure that laboratory detection levels meet the required criteria. All toxaphene results exceeded the RQL. Under the WCH statement of work, no qualification is required.

- **Completeness**

Data Package No. K0321 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiency was noted:

- Due to the lack of a matrix spike, matrix spike duplicate or LCS analysis, all toxaphene results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

All toxaphene results exceeded the RQL. Under the WCH statement of work, no qualification is required.

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the procedures herein are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

PCB DATA QUALIFICATION SUMMARY*

SDG: K0321	REVIEWER: TLI	Project: 128-F-3	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Toxaphene	J	All	No MS/MSD/LCS analysis

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

PCB ANALYSIS, SOIL MATRIX, (UG/KG)

Project: WASHINGTON CLOSURE HANFORD															
Laboratory: LLI	SDG: K0321														
Sample Number		J11VW0		J11VW1		J11VW2		J11VW3		J11VW4		J11VW5		J11VW6	
Remarks				Duplicate											
Sample Date		4/11/06		4/11/06		4/11/06		4/11/06		4/11/06		4/11/06		4/11/06	
Extraction Date		4/25/06		4/25/06		4/25/06		4/25/06		4/25/06		4/25/06		4/25/06	
Analysis Date		5/4/06		5/8/06		5/4/06		5/4/06		5/4/06		5/4/06		5/4/06	
Pesticide	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Alpha-BHC	5	1.5	U	1.5	U	1.4	U	1.4	U	1.5	U	1.5	U	1.5	U
Gamma-BHC (Lindane)	5	1.5	U	1.5	U	1.4	U	1.4	U	1.5	U	1.5	U	1.5	U
Beta-BHC	5	3.3		4.7		1.4	U	1.4	U	0.95		1.5	U	1.5	U
Heptachlor	5	1.5	U	1.5	U	1.4	U	1.4	U	1.5	U	1.5	U	1.5	U
Delta-BHC	5	1.5	U	1.5	U	1.4	U	1.4	U	1.5	U	1.5	U	1.5	U
Aldrin	5	0.56		1.5	U	1.4	U	1.4	U	1.5	U	1.5	U	1.5	U
Heptachlor Epoxide	5	0.41		1.5	U	1.4	U	1.4	U	0.55		1.5	U	1.5	U
gamma-Chlordane	5	1.5	U	1.5	U	1.4	U	1.4	U	1.5	U	1.5	U	1.5	U
Endosulfan I	5	1.2		1.5	U	1.4	U	1.4	U	1.5	U	1.5	U	1.5	U
alpha-Chlordane	5	0.89		2.8		1.4	U	1.4	U	1.5	U	1.5	U	1.5	U
4,4'-DDE	5	2.3		1.5	U	1.4	U	1.4	U	1.2		1.5	U	3.1	
Dieldrin	5	1.5	U	1.5	U	1.4	U	1.4	U	1.5	U	1.5	U	1.5	U
Endrin	5	1.5	U	1.5	U	1.4	U	1.4	U	1.5	U	1.5	U	1.5	U
4,4'-DDD	5	1.5	U	4.3		1.4	U	1.4	U	1.5	U	1.5	U	1.5	U
Endosulfan II	5	1.5	U	1.5	U	1.4	U	1.4	U	1.5	U	1.5	U	0.88	
4,4'-DDT	5	1.6		1.5	U	1.4	U	1.4	U	0.95		1.5	U	0.76	
Endrin Aldehyde	5	1.5	U	1.5	U	1.4	U	1.4	U	1.5	U	1.5	U	1.5	U
Endosulfan sulfate	5	1.3		5.8		1.4	U	1.4	U	0.80		1.5	U	1.5	U
Methoxyclor	5	1.5	U	9.8		1.4	U	1.4	U	1.5	U	1.5	U	1.5	U
Endrin Ketone	5	0.59		3.0		1.4	U	1.4	U	1.5	U	1.5	U	1.5	U
Toxaphene	5	15	UJ	15	UJ	14	UJ	14	UJ	15	UJ	15	UJ	15	UJ

000070

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results. All other qualifiers shown were applied during validation.

Pesticide/PCBs by GC, CLP List — Report Date: 05/11/06 15:18

RFW Batch Number: 0604L780 — Client: TNUHANFORD RC-032 K0321 — Work Order: 11343606001 — Page: 1

00000005

Sample Information		J11VW0		J11VW0		J11VW0		J11VW1		J11VW2		J11VW3	
	Cust ID:	J11VW0		J11VW0		J11VW0		J11VW1		J11VW2		J11VW3	
	RFW#:	001		001 MS		001 MSD		002		003		004	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	D.F.:	4.00		4.00		4.00		4.00		4.00		4.00	
	Units:	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
Surrogate:	Tetrachloro-m-xylene	108	%	120 *	%	110	%	96	%	126 *	%	121 *	%
	Decachlorobiphenyl	105	%	111	%	106	%	89	%	110	%	108	%
			fl		fl		fl		fl		fl		fl
Alpha-BHC		1.5	U	96	%	91	%	1.5	U	1.4	U	1.4	U
gamma-BHC (Lindane)		1.5	U	101	%	98	%	1.5	U	1.4	U	1.4	U
Beta-BHC		3.3		98	%	96	%	4.7		1.4	U	1.4	U
Heptachlor		1.5	U	100	%	99	%	1.5	U	1.4	U	1.4	U
Delta-BHC		1.5	U	82	%	81	%	1.5	U	1.4	U	1.4	U
Aldrin		0.56	J	80	%	79	%	1.5	U	1.4	U	1.4	U
Heptachlor epoxide		0.41	J	98	%	98	%	1.5	U	1.4	U	1.4	U
gamma-Chlordane		1.5	U	97	%	96	%	1.5	U	1.4	U	1.4	U
Endosulfan I		1.2	J	94	%	97	%	1.5	U	1.4	U	1.4	U
alpha-Chlordane		0.89	J	97	%	98	%	2.8		1.4	U	1.4	U
4,4'-DDE		2.3		90	%	94	%	1.5	U	1.4	U	1.4	U
Dieldrin		1.5	U	95	%	97	%	1.5	U	1.4	U	1.4	U
Endrin		1.5	U	99	%	100	%	1.5	U	1.4	U	1.4	U
4,4'-DDD		1.5	U	100	%	104	%	4.3		1.4	U	1.4	U
Endosulfan II		1.5	U	96	%	98	%	1.5	U	1.4	U	1.4	U
4,4'-DDT		1.6	J	94	%	103	%	1.5	U	1.4	U	1.4	U
Endrin aldehyde		1.5	U	95	%	99	%	1.5	U	1.4	U	1.4	U
Endosulfan sulfate		1.3	J	90	%	93	%	5.8		1.4	U	1.4	U
Methoxychlor		1.5	U	108	%	112	%	9.8		1.4	U	1.4	U
Endrin ketone		0.59	J	98	%	99	%	3.0		1.4	U	1.4	U
Toxaphene		15	U J	15	U	15	U	15	U J	14	U J	14	U J

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

6/21/06

0001

	Cust ID:	J11VW4	J11VW5	J11VW6	PBLKGF	PBLKGF BS
Sample Information	RFW#:	005	006	007	06LE0319-MB1	06LE0319-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	4.00	4.00	4.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	103 %	127 * %	114 %	116 %	114 %
	Decachlorobiphenyl	84 %	103 %	102 %	102 %	98 %
		fl	fl	fl	fl	fl
Alpha-BHC		1.5 U	1.5 U	1.5 U	0.33 U	114 %
gamma-BHC (Lindane)		1.5 U	1.5 U	1.5 U	0.33 U	111 %
Beta-BHC		0.95 J	1.5 U	1.5 U	0.33 U	106 %
Heptachlor		1.5 U	1.5 U	1.5 U	0.33 U	105 %
Delta-BHC		1.5 U	1.5 U	1.5 U	0.33 U	98 %
Aldrin		1.5 U	1.5 U	1.5 U	0.33 U	78 %
Heptachlor epoxide		0.55 J	1.5 U	1.5 U	0.33 U	105 %
gamma-Chlordane		1.5 U	1.5 U	1.5 U	0.33 U	104 %
Endosulfan I		1.5 U	1.5 U	1.5 U	0.33 U	106 %
alpha-Chlordane		1.5 U	1.5 U	1.5 U	0.33 U	104 %
4,4'-DDE		1.2 J	1.5 U	3.1	0.33 U	107 %
Dieldrin		1.5 U	1.5 U	1.5 U	0.33 U	109 %
Endrin		1.5 U	1.5 U	1.5 U	0.33 U	111 %
4,4'-DDD		1.5 U	1.5 U	1.5 U	0.33 U	112 %
Endosulfan II		1.5 U	1.5 U	0.88 J	0.33 U	104 %
4,4'-DDT		0.95 J	1.5 U	0.76 J	0.33 U	97 %
Endrin aldehyde		1.5 U	1.5 U	1.5 U	0.33 U	96 %
Endosulfan sulfate		0.80 J	1.5 U	1.5 U	0.33 U	100 %
Methoxychlor		1.5 U	1.5 U	1.5 U	0.33 U	100 %
Endrin ketone		1.5 U	1.5 U	1.5 U	0.33 U	101 %
Toxaphene		15 UJ	15 UJ	15 UJ	3.3 U	3.3 U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

6/21/06

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-032
LVL #: 0604L780
SDG/SAF # K0321/RC-032

W.O. #: 11343-606-001-9999-00
Date Received: 04-14-2006

CHLORINATED PESTICIDES

Seven (7) soil samples were collected on 04-11-2006.

The samples and their associated QC samples were extracted on 04-25-2006; and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 05-04-2006. The extraction procedure was based on method 3540C and the extracts were analyzed based on method 8081A. All soil samples are reported on a dry weight basis unless requested by the client, required by method, or noted otherwise.

The following is a summary of QC results accompanying the sample results. Lionville Laboratory Inc (LvLI) certifies that all test results meet the requirements of NELAC except as noted below:

1. All required holding times for extraction and analysis have been met.

2. The method blank was below the reporting limits for all target compounds.

3. Four (4) of twenty-two (22) surrogate recoveries was outside acceptance criteria. However the surrogate recovery acceptance criteria were met (i.e. no more than one outlier per sample).

4. All blank spike recoveries were within acceptance criteria.

5. All matrix spike recoveries were within acceptance criteria.

6. All samples required a instrument dilutions due chromatographic anomalies. The reporting limits were adjusted to reflect the necessary dilution.

7. The initial calibrations associated with this data set were within acceptance criteria.

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

8. The continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

9. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

5/11/06
Date

kim\r:\group\data\pest\tnu hanford\0604-780.pst

LVLI
LIONVILLE LABORATORY INC.

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-032-034	Page 1 of 1

Collector Coffman	Company Contact R.T. Coffman	Telephone No. 528-6409	Project Coordinator KESSNER, JH	Price Code	Data Turnaround
Project Designation 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location 128-F-3 Verification		SAF No. RC-032	Air Quality ☐	15 DAY
Ice Chest No. AFS-04-120	Field Logbook No. EFL-1174-1	COA R128F38000	Method of Shipment Fed Ex		
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. ~~R128F32000~~ RTC 4/11/06 A060355		Bill of Lading/Air Bill No. SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

Cool 4 degrees C

000016

			Preservation	None	Cool 4C	Cool 4C	Cool 4C							
			Type of Container	G/P	aG	aG	aG							
			No. of Container(s)	1	1	1	1							
			Volume	250mL	60mL	120mL	125mL							
SAMPLE ANALYSIS				See item (1) in Special Instructions.	Chromium Hex - 7196	VOA - 8260A (TCL)	Pesticides - 8081							
Sample No.	Matrix *	Sample Date	Sample Time											
J11VW0	SOIL	4/11/06	0815	X	X	X	X							F3-6
J11VW1	SOIL		0815	X	X	X	X							F3-6D
J11VW2	SOIL		0825	X	X	X	X							F3-7
J11VW3	SOIL		0835	X	X	X	X							F3-8
J11VW4	SOIL	4/11/06	0845	X	X	X	X							F3-9

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
RTCoffman/RT Coffman	4/11/06 1430	Refer #2C, 3728	4/11/06 1430
3728 #2C	4-12-06 1130	[signature]	4/12/06 1130
WCH [signature]	4/12/06 1500	FED EX	
FedEx		[signature]	4/14/06 0925

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7471 - (CV)

Personnel not available to relinquish samples from 3728 Ref# 2C on 4/12/06

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-032-034	Page 3 of 3

Collector	Company Contact / Telephone No.	Project Coordinator	Price Code / Data Turnaround
Coffman	R.T. Coffman 528-6409	KESSNER, JH	Air Quality ☐ 15 DAY
Project Designation	**Sampling Location**	**SAF No.**	
100-F Remaining Sites Burial Grounds - Soil Full Protocol	128-F-3 Verification	RC-032	
Ice Chest No. AF5-04-120	**Field Logbook No.** EFL-1174-1	**COA** ~~R128F32000~~	**Method of Shipment** Fed Ex
Shipped To EBERLINE SERVICES (LIONVILLE)	**Offsite Property No.** ~~R128F32000~~ RTC 4/11/06 A060355		**Bill of Lading/Air Bill No.** SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

Cool 4 degrees C

00000170

Preservation	None	Cool 4C	Cool 4C	Cool 4C							
Type of Container	G/P	aG	aG	aG							
No. of Container(s)	1	1	1	1							
Volume	250mL	60mL	120mL	125mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	VOA - 8260A (TCL)	Pesticides - 8081							
Sample No.	**Matrix ***	**Sample Date**	**Sample Time**								
J11VW5	SOIL	4/11/06	0855	X	X	X	X				F3-10
J11VW6	SOIL	4/11/06	0905	X	X	X	X				F3-SP

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
RT Coffman/RT Coffman	4/11/06 1430	Rece #2C 3728	4/11/06 1430
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
3728 #2C	4-12-06 1130	JR Edmundson	4-12-06 1130
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
JR Edmundson	4-12-06 1500	FED EX	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
FedEx		JPenny	4/14/06 0925
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7471 - (CV)

Personnel not available to relinquish samples from 3728 Ref #2C on 4/12/06

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (08/29/2005)

Appendix 5

Data Validation Supporting Documentation

PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 128-F-3			DATA PACKAGE: K0321		
VALIDATOR: TLT		LAB: LLT		DATE: 6/9/06	
			SDG: K0321		
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
J11VW0 J11VW1 J11VW2 J11VW3					
J11VW4 J11VW5 J11VW6					
				Soil	

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes (No) N/A

Comments: _____

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations acceptable? ..... Yes No N/A

Continuing calibrations acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

DDT and endrin breakdowns acceptable? ..... Yes No N/A

Comments: _____

PCB DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

Calibration blanks analyzed? (Levels D, E) ..... Yes No N/A
Calibration blank results acceptable? (Levels D, E) ..... Yes No N/A
Laboratory blanks analyzed? ..... Yes No N/A
Laboratory blank results acceptable? ..... Yes No N/A
Field/trip blanks analyzed? (Levels C, D, E) ..... Yes No N/A
Field/trip blank results acceptable? (Levels C, D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A
Comments: no FB

4. ACCURACY (Levels C, D, and E)

Surrogates analyzed? ..... Yes No N/A
Surrogate recoveries acceptable? ..... Yes No N/A
Surrogates traceable? (Levels D, E) ..... Yes No N/A
Surrogates expired? (Levels D, E) ..... Yes No N/A
MS/MSD samples analyzed? ..... Yes No N/A
MS/MSD results acceptable? ..... Yes No N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A
MS/MSD standards expired? (Levels D, E) ..... Yes No N/A
LCS/BSS samples analyzed? ..... Yes No N/A
LCS/BSS results acceptable? ..... Yes No N/A
Standards traceable? (Levels D, E) ..... Yes No N/A
Standards expired? (Levels D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A
Performance audit sample(s) analyzed? ..... Yes No N/A
Performance audit sample results acceptable? ..... Yes No N/A
Comments: no toxaphene MS/MSD/LCS - Jaly

PCB DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? ..... Yes No N/A
Duplicate results acceptable? ..... Yes No N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A
MS/MSD standards expired? (Levels D, E) ..... Yes No N/A
Field duplicate RPD values acceptable? ..... Yes No N/A
Field split RPD values acceptable? ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A
Comments: No toxaphen MS/MSD - J all

6. SYSTEM PERFORMANCE (Levels D and E)

Chromatographic performance acceptable? ..... Yes No N/A
Positive results resolved acceptably? ..... Yes No N/A
Comments:

7. HOLDING TIMES (all levels)

Samples properly preserved? ..... Yes No N/A
Sample holding times acceptable? ..... Yes No N/A
Comments:

PCB DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Compound identification acceptable? (Levels D, E) ..... Yes No (N/A)
Compound quantitation acceptable? (Levels D, E) ..... Yes No (N/A)
Results reported for all requested analyses? ..... (Yes) No N/A
Results supported in the raw data? (Levels D, E) ..... Yes No (N/A)
Samples properly prepared? (Levels D, E) ..... Yes No (N/A)
Detection limits meet RDL? ..... Yes (No) N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)
Comments: all toxaphene over

9. SAMPLE CLEANUP (Levels D and E)

Fluoricil ® (or other absorbent) cleanup performed? ..... Yes No (N/A)
Lot check performed? ..... Yes No (N/A)
Check recoveries acceptable? ..... Yes No (N/A)
GPC cleanup performed? ..... Yes No (N/A)
GPC check performed? ..... Yes No (N/A)
GPC check recoveries acceptable? ..... Yes No (N/A)
GPC calibration performed? ..... Yes No (N/A)
GPC calibration check performed? ..... Yes No (N/A)
GPC calibration check retention times acceptable? ..... Yes No (N/A)
Check/calibration materials traceable? ..... Yes No (N/A)
Check/calibration materials Expired? ..... Yes No (N/A)
Analytical batch QC given similar cleanup? ..... Yes No (N/A)
Transcription/Calculation Errors? ..... Yes No (N/A)
Comments:

Date: 21 June 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-F Remaining Sites Burial Grounds – Soil Full Protocol - Waste Site 128-F-3
Subject: Wet Chemistry - Data Package No. K0321-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0321 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
J11VW0	4/11/06	Soil	C	Chromium VI by 7196A
J11VW1	4/11/06	Soil	C	Chromium VI by 7196A
J11VW2	4/11/06	Soil	C	Chromium VI by 7196A
J11VW3	4/11/06	Soil	C	Chromium VI by 7196A
J11VW4	4/11/06	Soil	C	Chromium VI by 7196A
J11VW5	4/11/06	Soil	C	Chromium VI by 7196A
J11VW6	4/11/06	Soil	C	Chromium VI by 7196A

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, Rev. 4, February 2005). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by Client

DATA QUALITY PARAMETERS

- **Holding Times**

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 30 days for chromium VI.
If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged

"J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

- **Method Blanks**

Method Blanks

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. All blank results must fall below the contract required detection limit (CRQL) to be acceptable.

All method blank results were acceptable.

Field (Equipment) Blank

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 130% and a sample result less than the IDL, no qualification is required.

All accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in

the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J11VW0/J11VW1) were submitted for analysis. Field duplicates are analyzed using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQLs) to ensure that laboratory detection levels meet the required criteria. The chromium VI result in sample J11VW0 exceeded the RQL. Under the WCH statement of work, no qualification is required. All other analytes met the RQL.

- **Completeness**

Data package K0321 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The chromium VI result in sample J11VW0 exceeded the RQL. Under the WCH statement of work, no qualification is required.

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with BHI validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

WET CHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: K0321	REVIEWER: TLI	Project: 128-F-3	PAGE 1 OF 1
COMMENTS: No qualifiers assigned.			

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: WASHINGTON CLOSURE HANFORD															
Lab: LLI	SDG: K0321														
Sample Number		J11VW0		J11VW1		J11VW2		J11VW3		J11VW4		J11VW5		J11VW6	
Remarks				Duplicate											
Sample Date		4/11/06		4/11/06		4/11/06		4/11/06		4/11/06		4/11/06		4/11/06	
Wet Chemistry	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chromium VI	0.5	2.2	U	0.23	U	0.22	U	0.21	U	0.22	U	0.22	U	0.23	U

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results. All other qualifiers shown were applied during validation.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/25/06

CLIENT: TNUHANFORD RC-032 K0321 LVL LOT #: 0604L780
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J11VW0	% Solids	89.8	%	0.01	1.0
		Chromium VI	2.2 u	MG/KG	2.2	10.0
-002	J11VW1	% Solids	88.3	%	0.01	1.0
		Chromium VI	0.23 u	MG/KG	0.23	1.0
-003	J11VW2	% Solids	92.1	%	0.01	1.0
		Chromium VI	0.22 u	MG/KG	0.22	1.0
-004	J11VW3	% Solids	93.8	%	0.01	1.0
		Chromium VI	0.21 u	MG/KG	0.21	1.0
-005	J11VW4	% Solids	91.6	%	0.01	1.0
		Chromium VI	0.22 u	MG/KG	0.22	1.0
-006	J11VW5	% Solids	90.2	%	0.01	1.0
		Chromium VI	0.22 u	MG/KG	0.22	1.0
-007	J11VW6	% Solids	87.5	%	0.01	1.0
		Chromium VI	0.23 u	MG/KG	0.23	1.0

6/21/06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-032 K0321
LVL#: 0604L780

W.O.#: 11343-606-001-9999-00
Date Received: 04-14-06

INORGANIC NARRATIVE

1. This narrative covers the analyses of 7 soil samples.

2. The samples were prepared and analyzed in accordance with the methods checked on the attached glossary.

   LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete list of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager. LvLI certifies that all test results meet the requirements of NELAC with any exception noted in the following statements.

3. Sample holding times as required by the method and/or contract were met.

4. The results presented in this report are derived from samples that met LvLI's sample acceptance policy.

5. The method blank for Chromium VI was within the method criteria.

6. The Laboratory Control Samples (LCS) for Chromium VI were within the laboratory control limits.

7. The matrix spike recoveries for Chromium VI were within the 75-125% control limits.

8. The replicate analysis for Chromium VI was within the 20% Relative Percent Difference (RPD) control limit.

9. Results for solid samples are reported on a dry weight basis.

10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

5-5-06
Date

njp\i04-780

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-032-034	Page 2 of 2

Collector	Company Contact / Telephone No.	Project Coordinator	Price Code / Data Turnaround
Coffman	R.T. Coffman 528-6409	KESSNER, JH	Air Quality ☐ 15 DAY

Project Designation	Sampling Location	SAF No.
100-F Remaining Sites Burial Grounds - Soil Full Protocol	128-F-3 Verification	RC-032

Ice Chest No.	Field Logbook No.	COA	Method of Shipment
AFS-04-120	EFL-1174-1	R128F30000	Fed Ex

Shipped To	Offsite Property No.	Bill of Lading/Air Bill No.
EBERLINE SERVICES / LIONVILLE	~~R126F32000~~ RTC 4/11/06 A060355	SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

Cool 4 degrees C

Preservation	None	Cool 4C	Cool 4C	Cool 4C							
Type of Container	G/P	aG	aG	aG							
No. of Container(s)	1	1	1	1							
Volume	250mL	60mL	120mL	125mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions	Chromium Hex - 7196	VOA - 8260A (TCL)	Pesticides - 8081							
Sample No.	Matrix *	Sample Date	Sample Time								
J11VW0	SOIL	4/11/06	0815	X	X	X	X				F3-6
J11VW1	SOIL		0815	X	X	X	X				F3-6D
J11VW2	SOIL		0825	X	X	X	X				F3-7
J11VW3	SOIL		0835	X	X	X	X				F3-8
J11VW4	SOIL	4/11/06	0845	X	X	X	X				F3-9

0000134

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By/Removed From / Date/Time	Received By/Stored In / Date/Time	
RT Coffman/RT Coffman 4/11/06 1430	Refer # 2C, 3728 4/11/06 1430	
Relinquished By/Removed From / Date/Time	Received By/Stored In / Date/Time	
3728 # 2C 4-12-06 1130	[illegible] 4-12-06 1130	
Relinquished By/Removed From / Date/Time	Received By/Stored In / Date/Time	
WCH 4-12-06 1500	FED EX	
Relinquished By/Removed From / Date/Time	Received By/Stored In / Date/Time	
FedEx	JPWing 4/14/06 0925	
Relinquished By/Removed From / Date/Time	Received By/Stored In / Date/Time	
Relinquished By/Removed From / Date/Time	Received By/Stored In / Date/Time	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc]; Mercury - 7471 - (CV)

Personnel not available to relinquish samples from 3728 Ref # 2C on 4/12/06

Matrix *

S=Soil
SE=Sediment
SD=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		RC-032-034	Page 2 of 2
Collector: Coffman	Company Contact: R.T. Coffman	Telephone No.: 528-6409	Project Coordinator: KESSNER, JH	Price Code / Data Turnaround: 15 DAY
Project Designation: 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location: 128-F-3 Verification		SAF No.: RC-032	Air Quality ☐
Ice Chest No.: AFS-04-120	Field Logbook No.: EFL-1174-1	COA: R128F32000	Method of Shipment: Fed Ex	
Shipped To: EBERLINE SERVICES/ LIONVILLE	Offsite Property No.: ~~R128F32000~~ RTC 4/11/06 A060355		Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

Cool 4 degrees C

Preservation	None	Cool 4C	Cool 4C	Cool 4C							
Type of Container	G/P	aG	aG	aG							
No. of Container(s)	1	1	1	1							
Volume	250mL	60mL	120mL	125mL							

0000150

SAMPLE ANALYSIS				See item (1) in Special Instructions.	Chromium Hex - 7196	VOA - 8260A (TCL)	Pesticides - 8081						
Sample No.	Matrix *	Sample Date	Sample Time										
J11VW5	SOIL	4/11/06	0855	X	X	X	X						F3-10
J11VW6	SOIL	4/11/06	0905	X	X	X	X						F3-SP

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: RT Coffman/RT Coffman	Date/Time: 1430 4/11/06	Received By/Stored In: Regie #2C, 3728	Date/Time: 1430 4/11/06
Relinquished By/Removed From: 3728 #2C	Date/Time: 4-12-06 1130	Received By/Stored In: JR Edmundson	Date/Time: 4-12-06 1130
Relinquished By/Removed From: JR Edmundson WCH	Date/Time: 4-12-06 1500	Received By/Stored In: FED EX	Date/Time:
Relinquished By/Removed From: Fed Ex	Date/Time:	Received By/Stored In: JPlumb	Date/Time: 4/14/06 0925
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV)

Personnel not available to relinquish samples from 3728 Ref #2C on 4/12/06

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

GHi-EE-011 (08/29/2005)

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100F 128-F-3			DATA PACKAGE: K0321		
VALIDATOR: TCT		LAB: LLI		DATE: 6/9/06	
			SDG: K0321		

ANALYSES PERFORMED					
Anions/IC	TOC	TOX	TPH-418.1	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride	Chromium-VI	pH	NO_3/NO_2
Sulfate	TDS	TKN	Phosphate		

SAMPLES/MATRIX
J11VW0 J11VW1 J11VW2 J11VW3 J11VW4 J11VW5 J11VW6
Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes (No) N/A

Comments: _____

_____

_____

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations performed on all instruments? ..... Yes No (N/A)

Initial calibrations acceptable? ..... Yes No (N/A)

ICV and CCV checks performed on all instruments? ..... Yes No (N/A)

ICV and CCV checks acceptable? ..... Yes No (N/A)

Standards traceable? ..... Yes No (N/A)

Standards expired? ..... Yes No (N/A)

Calculation check acceptable? ..... Yes No (N/A)

Comments: _____

_____

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

ICB and CCB checks performed for all applicable analyses? (Levels D, E) ..... Yes No N/A
ICB and CCB results acceptable? (Levels D, E) ..... Yes No N/A
Laboratory blanks analyzed? ..... Yes No N/A
Laboratory blank results acceptable? ..... Yes No N/A
Field blanks analyzed? (Levels C, D, E) ..... Yes No N/A
Field blank results acceptable? (Levels C, D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A
Comments: no FB

4. ACCURACY (Levels C, D, and E)

Spike samples analyzed? ..... Yes No N/A
Spike recoveries acceptable? ..... Yes No N/A
Sike standards NIST traceable? (Levels D, E) ..... Yes No N/A
Spike standards expired? (Levels D, E) ..... Yes No N/A
LCS/BSS samples analyzed? ..... Yes No N/A
LCS/BSS results acceptable? ..... Yes No N/A
Standards traceable? (Levels D, E) ..... Yes No N/A
Standards expired? (Levels D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A
Performance audit sample(s) analyzed? ..... Yes No N/A
Performance audit sample results acceptable? ..... Yes No N/A
Comments: no PAS

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? ..... Yes No N/A

Duplicate results acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards expired? (Levels D, E) ..... Yes No N/A

Field duplicate RPD values acceptable? ..... Yes No N/A

Field split RPD values acceptable? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: _____

6. HOLDING TIMES (all levels)

Samples properly preserved? ..... Yes No N/A

Sample holding times acceptable? ..... Yes No N/A

Comments: _____

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses? ..... (Yes) No N/A

Results supported in the raw data? (Levels D, E) ..... Yes No (N/A)

Samples properly prepared? (Levels D, E) ..... Yes No (N/A)

Detection limits meet RDL? ..... Yes (No) N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)

Comments: one over

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 04/25/06

CLIENT: TNUHANFORD RC-032 K0321 LVL LOT #: 0604L780
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	06LVI028-MB1	Chromium VI	0.20 u	MG/KG	0.20	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 04/25/06

CLIENT: TNUHANFORD RC-032 K0321 LVL LOT #: 0604L780
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-004	J11VW3	Soluble Chromium VI	4.6	0.21u	4.3	111.6	1.0
		Insoluble Chromium VI	1320	0.21u	1150	114.8	100
BLANK10	06LVI028-MB1	Soluble Chromium VI	3.9	0.20u	4.0	98.4	1.0
		Insoluble Chromium VI	1130	0.20u	1080	104.0	100

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 04/25/06

CLIENT: TNUHANFORD RC-032 K0321 LVL LOT #: 0604L780
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
-004REP	J11VW3	Chromium VI	0.21u	0.21u	NC	1.0